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ORIGINAL ARTICLE

Premature Neonatal Pain Assessment Criteria: Comparison of nurses' and physicians' Knowledge in Neonatal Intensive Care Units

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ABSTRACT
One of the most noticeable reasons of why the infant pain is ignored by the medical staffs is the shortness of their knowledge about precise tools of assessing the neonates' pain. The nurses and physicians are responsible for assessing and managing the infant pain properly. The present study was aimed to compare the nurses' and physicians' knowledge of the standard procedures of assessing the neonatal pain. In this descriptive cross-sectional study, 62 nurses and 48 physicians from 5 hospitals located in Tehran, Iran, were selected. Survey instrument was consisted of two sections (demographical characteristics, knowledge of behavioral and physiological symptoms), the scores categorized into three scales, inappropriate (<50%), relatively appropriate (50-70%), and appropriate (> 70%). Cronbach's alpha coefficient was 0.8. SPSS software V. 20 was applied. Descriptive and analytic statistics tests like Man Whitney, Kroskal-valis, and spearman correlation coefficient were used. the average score of nurses' knowledge about the standard assessment criteria of infant pain was higher than the physicians' level of knowledge, except in the issue of physiological changes of an in pain infant. However, the difference was not statistically significant (p = 0.161). There was a significant relationship (p = 0.006) between the nurses' and physicians' knowledge and attending the educational programs. the level of nurses' and physicians' knowledge of infant pain is not satisfactory. Therefore, holding regular educational programs for at service staffs and paying more attention to the issue of neonate pain and its related assessment procedures in the nursing and medical sciences are proposed in this study as ways of enhancing the nurses' and physicians' ability and knowledge.
Keywords: *pain assessment, premature neonates, neonatal intensive care unit*

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INTRODUCTION

As the most vulnerable group of society, neonates are the ones who have been paid less attention, particularly premature ones (1). The neonates who are delivered by 37th week of pregnancy are called as premature neonates. Furthermore, being born prematurely and having lower than normal weight are the factors which increase the rate of death among the neonates (2). More than 12 millions of premature neonates are born annually around the world. There is no valid published statistics about developing countries, In order to take care of them; they have to be put under 300 painful procedures in neonatal intensive care unit (3).

Pain is indeed a complex and multi-dimensional experience that depends on one's sensual and intellectual perception of it. Various aspects of one's life can be affected by experiencing pain, including physical, sensual and social ones.. It was believed for a long time that infants are not able to feel pain due mostly to the prematurity of their neural systems (4). Over the last two decades, a wide range of studies have been conducted on this issue which this claim is now disproved (2). In other words, the growth of neonates' neural system begins at the time of pregnancy (4). the pain is communicated by infants through special and non-verbal communicative abilities like facial changes, physical movements, raising eyebrows, increase of heartbeat and blood pressure, anger, increase of sweating and widening of pupils (5).

However, even by considering these ways of communication, infant pain is not recognized in most of the cases (4).

Neonates, right after their birth, experience pain from various types of treatment procedures. The severity of pain is directly related to the age as well as the types of illnesses in the neonates. Therefore, the vulnerable and premature neonates experience more level of pain, in comparison with the normal ones (6),(7). Applying such painful procedures on these infants can jeopardize their health by changing their threshold of feeling pain (i. e. this effect may last for a life time), and decreasing the immune system of their bodies which could contribute to permanent disabilities (3). Although these neonates experience severe pain, they don't visibly reflect their pain; therefore, it is needed to have access to more indicative assessment tools than the current ones so as to know their reflective mechanisms(8), (9).

Preventing the premature neonates from experiencing severe pain in NICU should be considered as a highly important task, since it is not only a moral duty, but also a reasonable expectation from their parents (3). American pain association ranked pain as the fifth vital sign of life. If the importance of assessing pain be the same as controlling the life vital signs, there is a chance to properly prevent and treat one's pain (8),(10). In order to detect pain in an infant, they should be checked every 4 to 6 hours by applying standard procedures. The pain assessment should be comprehensive, and multi-dimensional. Also, it should include the assessment of related behavioral, physiological, and mental signs (9).

One of the important factors upon which the infant pain can be assessed is the knowledge of pain physiology. Physiological, behavioral, and chemical responses are three known means which reflect the infant pain. Nurses and physicians who work in NICU can consider these responses so as to assess the presence of pain in a neonate (5). Based on studies, There are several standard methods of assessing pain, including premature infant pain profile (PIPP), neonatal facial coding system (NFCS), neonatal infant pain scale (NIPS), crying the requirement for oxygen supplementation increase in heart rate facial expression and sleepless (CRIES). Physiological and behavioral indicators included within these methods are pregnancy age, behavioral conditions, heartbeat, oxygen saturation level, raised eyebrow, hatched lips and nose, shutting and pressuring eyes, chin vibration, insomnia, cry, breathing patterns and facial moods (5), (9), (3), (11)and(12).

Nurses and physicians play an important role and responsibility to assess, prevent, and manage the infant pain. When a patient pain is recognized, physician prescribes a proper sedative with appropriate dosage along with the times of delivering that to the patient; then, it is the nurse who decides whether or not to deliver the prescribed drug. Making reasonable decisions and controlling the pain effectively depend on conducting precise and accurate pain assessment (9), (13), and (14). Although the pain assessment of patients is one of the vital parts of taking care of them, care providers, nurses in particular, do not pay enough attention to this part (8). Based on the result of a previously conducted study, the nurses who took care of the infants did not have proper and enough knowledge of either medication or non-medication ways of managing the infant pain. The care providers are not familiar with proper procedures of pain assessment; in fact, this is one of the main reasons of why they are not able to properly identify the infant pain (5), (15)and (16).

Therefore, it is necessary to assess the ability of nurses and physicians in recognition of behavioral and physiological reflexes of infants to pain (5). In a study conducted by Brown, it was reported that among the nurses only 27% of them were applying the pain assessment procedures and 33% of them did not use any of those procedures (5). There has been a wide range of studies around the world on infant pains and non-medication ways of handling and controlling it. The familiarity of Iranian nurses and physicians with the newly developed methods of assessing neonatal pain is limited. Therefore, the present study aims to compare the nurses' and physicians' knowledge of the standard procedures of pain assessment in premature neonates.

MATERIALS AND METHODS

In this descriptive cross-sectional study, 62 nurses and 48 physicians (110 individuals) from the general hospitals (Shariati, Vali-Asr, Mirza Kuchak Khan and Bahrami Hospitals and children medical center) located in Tehran, Iran, were selected based on census method in 2012.

Inclusion criteria for nurses were to have a related undergraduate degree or higher one (e.g. master, PhD) and being employed as a registered nurse in chosen hospitals and have at least 1 year experience in pediatric or neonatal caring, Also, being a pediatric resident who currently involved in caring of neonates was the factor for selecting the physicians.

Instrument

Survey instrument was a researcher made questionnaire which was developed and applied to collect the needed data. It was consisted of two sections; the first one was included with the questions about demographical characteristics of the physicians and nurses (9 questions about sex, age, marital status,

education, work experience, training courses experience, number of children). For the second part, the questions were designed in a way to assess their knowledge of behavioral and physiological symptoms, facial changes, and tone and body movement of in pain infants (14 questions about heart rate, respiratory rate, respiration quality, blood pressure, pupil changes, skin color, voice changes etc); these factors were based on behavioral and physiological indicators applied in standard procedures of pain assessment, namely, NFCS, PIPP, NIPS, and CRIES. It is noteworthy that the included questions in the questionnaire were designed based on a comprehensive study of related researches (i. e. published articles and books) which have been conducted recently (5)-(7) -(8)-(10) -(17). The answers were multiple choices and more than one answer was possible. there was no golden standard for scoring of this questionnaire so the individuals' knowledge of the related issue was quantified and categorized into three scales, namely, inappropriate (<50%), relatively appropriate (50-70%), and appropriate (> 70%).

In order to determine the validity of the questionnaire, facial and content validity method was applied. In other words, the prepared questionnaire was sent to 10 nurse, 10 physicians and 10 faculty members of nursing sciences and midwifery department of Tehran University of Medical Sciences who were professional about neonatal care to applying their ideas in order to improvement of the questionnaire. Furthermore, the internal reliability of the questionnaire was tested by applying Cronbach's alpha coefficient which was calculated to be 0.8.

Procedure

The necessary ethical approval and permissions were received from research ethical committees of Tehran University of Medical Sciences, nursing and midwifery faculty and all 5 hospitals. The researcher referred to NICU of hospitals on different days and after giving the nurses and physicians information about the study and obtaining a written consent, each one has this opportunity to decline participation, the questionnaires were given to them at the beginning of their shifts and collected at the end. In fact, in this way which was purposefully chosen, the participants' access to data bases and getting any consultation was prevented.

SPSS software V. 20 was applied for data analysis. Descriptive and analytic statistics tests like Man Whitney, Kroskal-valis, and spearman correlation coefficient were used. In the present study, $p < 0.05$ was pointed as the significance level of the correlations among the factors.

Furthermore, the following moral codes were taken into account which all participants documents will keep confidential and their email address was received to send them the resukts of study, if they willing to.

RESULTS

Considering the demographical characteristics of the study group, the average age of the nurses and physicians were respectively 32.36 (± 6.03), and 33.89 (± 5.71) years. Also, the average amount of the nurses' and physicians' clinical experience was 7.80 (±5.93) and 6.85 (± 5.89) years, respectively. Furthermore, the nurses' and physicians' experience, on average, in delivering medical services in NICU was respectively 4.47 (± 4.73) and 1.91 (± 3.66) years. It should also be mentioned that the selected nurses and physicians, on average, had respectively 0.65 (± 0.81) and 0.66 (± 0.96) children. The rest of the demographical information is shown in Table 1.

The nurses' and physicians' knowledge of the physiological indicators of pain assessment criteria was showed that the average scale of nurses' and physicians' knowledge of physiological changes of the infants was respectively 48.75 and 65.54. In other words, the physicians were more familiar with the physiological indicators than the nurses were. Also, statistical analysis showed a significant difference ($p<0.008$) between the level of nurses' and physicians' knowledge of the issue, which is shown in Table 2. However, the averages scale of the nurses' and physicians' knowledge of the facial changes of in pain infants (i. e. corresponding to the behavioral indicators of pain assessment criteria) were 62.73 and 45.81, respectively. It shows that the nurses' level of knowledge in this issue is significantly ($p<0.004$) higher than the physicians'. In addition, there was a significant difference ($p<0.033$) between the nurses' and physicians' knowledge of the changes in the voice of in pain infants. The average scale of the nurses' and physicians' knowledge in this issue was 60.76 and 48.45, respectively. Although the average scale of nurses' knowledge about the physical movement of an in pain infant was 60.14, which is higher than 49.28 of the physicians', the analysis did not show a significant difference ($p= 0.065$) between their scales; the result is also shown in Table 3. In consideration with the first aim of this study, the results showed that the nurses' knowledge about physiological and behavioral indicators of pain assessment criteria is 59.16, which is also higher than 50.60 of the physicians'. However, as it is shown in Figure 1, this difference was not found to be significant ($p = 0.161$).

In relation with the second aim of the present study (i. e. assessing the relationship of the nurses' and physicians' demographical characteristics with their level of knowledge about aforementioned issues) the